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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/761,128	01/20/2004	Yasuo Arishima	5271-0111PUS1	8831
2292 7590 07/08/2008 BIRCH STEWART KOLASCH & BIRCH PO BOX 747 FALLS CHURCH, VA 22040-0747				
EXAMINER				
CHUO, TONY SHENG HSIANG				
ART UNIT		PAPER NUMBER		
1795				
NOTIFICATION DATE		DELIVERY MODE		
07/08/2008		ELECTRONIC		

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

mailroom@bskb.com

# Office Action Summary

**Application No.**

10/761,128

**Applicant(s)**

ARISHIMA ET AL.

**Examiner**

Tony Chuo

**Art Unit**

1795

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --  
**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 04 April 2008.  
2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.  
3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1,3-10 and 12-22 is/are pending in the application.  
4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.  
5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.  
6) ☒ Claim(s) 1,3-10 and 12-22 is/are rejected.  
7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.  
8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.  
10) ☒ The drawing(s) filed on 20 January 2004 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).  
11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).  
a) ☒ All b) ☐ Some \* c) ☐ None of:  
1. ☒ Certified copies of the priority documents have been received.  
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.  
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- 1) ☐ Notice of References Cited (PTO-892)  
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)  
3) ☐ Information Disclosure Statement(s) (PTO/SB/888)  
Paper No(s)/Mail Date \_\_\_\_\_  
4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date \_\_\_\_\_  
5) ☐ Notice of Informal Patent Application  
6) ☐ Other: \_\_\_\_\_

## DETAILED ACTION

### *Response to Amendment*

1. Claims 1, 3-10, and 12-22 are currently pending. Claims 2 and 11 are cancelled. The amended claims do not overcome the previously stated 103 rejections. Therefore, upon further consideration, claims 1, 3-10, and 12-22 stand rejected under the following 103 rejections.

### *Claim Rejections - 35 USC § 103*

2. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

3. Claims 1, 3, 4, 6-10, 12, 13, and 15-22 are rejected under 35 U.S.C. 103(a) as being unpatentable over Tabata et al (US 2002/0071980) in view of Ueda et al (US 2004/0115515), and further in view of Kohler et al (US 2003/0224233).

The Tabata reference discloses a fuel cell comprising: a membrane electrode assembly comprising a positive electrode, a negative electrode, and a solid polymer electrolyte membrane in between the positive and negative electrodes, wherein both the positive and negative electrodes comprises a laminate of two catalyst layers "2a" / "3a" & "2b" / "3b" and an ion-conducting resin, and wherein the catalyst layers are bonded together by a solvent which functions as an adhesive layer (See paragraphs

[0031],[0032]),[0041] and Figure 4). In addition, it also discloses a catalyst content of each catalyst layer that is  $0.01 - 1 \text{ mg/cm}^2$  which corresponds to a catalyst content in the laminate that is  $0.02 - 2 \text{ mg/cm}^2$  (See paragraph [0042]). In addition, it also discloses the use of the membrane electrode assemblies in fuel cells (See paragraph [0019]). In addition, it also discloses that the catalysts contained in the first and second catalyst layer comprise particles as free standing catalyst with a high surface area or supported on carbon particles, wherein the catalyst particles are platinum particles (See paragraph [0021],[0059]). It is inherent that fine catalyst particles have high surface area.

However, Tabata et al does not expressly teach each of the electrode layers that has a thickness of at most  $50 \text{ }\mu\text{m}$ ; a laminate that has a total thickness of  $30$  to  $300 \text{ }\mu\text{m}$ ; or a laminate that has a total thickness of  $70$  to  $300 \text{ }\mu\text{m}$ . The Ueda reference discloses a bilayer structure catalyst layer wherein each catalyst layer has a thickness that is usually  $2$  to  $50 \text{ }\mu\text{m}$  which corresponds to a total thickness of the laminate that is  $4$  to  $100 \text{ }\mu\text{m}$  (See paragraph [0072]).

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify Tabata fuel cell to include each of the electrode layers that has a thickness of at most  $50 \text{ }\mu\text{m}$ ; a laminate that has a total thickness of  $30$  to  $300 \text{ }\mu\text{m}$ ; or a laminate that has a total thickness of  $70$  to  $300 \text{ }\mu\text{m}$  in order to minimize the overall thickness of the fuel cell, thereby maximizing the current density of the fuel cell. In addition, product claims with numerical ranges which overlap prior art ranges

were held to have been obvious under 35 USC 103 (See *In re Wertheim* 191 USPQ 90 (CCPA 1976)).

However, Tabata et al as modified by Ueda et al does not expressly teach an adhesive layer that contains a polymer material having a proton conducting property that is present more in an interface part of each of the electrode layers than in an inner part. The Kohler reference teaches the concept of using a carbon black containing adhesive paste to laminate two electrode layers wherein the adhesive contains a Nafion solution that has proton conducting property (See paragraph [0048]). Examiner's note: It is inherent that the polymer material is present more in an interface part of each of the electrode layers than in an inner part because the adhesive layer is coated on the surface of each electrode layer which is also the interface part of each electrode layer.

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the Tabata/Ueda fuel cell to include an adhesive layer that contains a polymer material having a proton conducting property that is present more in an interface part of each of the electrode layers than in an inner part in order to securely bond the electrode layers together by using a low temperature/low pressure laminating process that simplifies the handling and assembly of the membrane electrode assembly. In addition, the invention as a whole would have been obvious to one of ordinary skill in the art at the time the invention was made because the disclosure of Kohler et al indicates that an adhesive paste that contains a Nafion solution with proton conducting properties is a suitable material for use as an adhesive for bonding electrode layers. The selection of a known material based on its suitability

for its intended use has generally been held to be *prima facie* obvious (MPEP §2144.07). As such, it would be obvious to use an adhesive paste that contains a Nafion solution with proton conducting properties.

4. Claims 5 and 14 are rejected under 35 U.S.C. 103(a) as being unpatentable over Tabata et al (US 2002/0071980) in view of Ueda et al (US 2004/0115515) and Kohler et al (US 2003/0224233) as applied to claims 1 and 10 above, and further in view of Dube et al (US 2004/0089357).

However, Tabata et al as modified by Ueda et al and Kohler et al does not expressly teach an adhesive layer that has a thickness of 1 to 5  $\mu\text{m}$ . The Dube reference discloses an integrated fuel cell device wherein the layers are laminated with adhesive layers that are thinned to a 5  $\mu\text{m}$  thickness (See paragraph [0048],[0049]). Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the Tabata/Ueda/Kohler fuel cell to include an adhesive layer that has a thickness of 1 to 5  $\mu\text{m}$  in order to reduce the resistance between the electrode layers, thereby improving the performance of the fuel cell.

### ***Response to Arguments***

5. Applicant's arguments filed 4/4/08 have been fully considered but they are not persuasive.

The applicant argues that paragraph [0072] of Ueda et al mentions that the catalyst layer having a bilayer structure is characterized in that the catalyst layer includes gold fine particles formed on a platinum catalyst layer. Thus, even if Tabata et

al. and Ueda et al. are combined, it is not possible to arrive at a configuration in which the catalyst in each of the electrode layers consists essentially of fine particles of platinum or an alloy thereof as recited in the present invention. The examiner disagrees with the applicant's analysis of the cited references. As stated above, the Tabata reference discloses a catalyst that consists essentially of fine particles of platinum. The Ueda reference is relied upon for the teaching of a bilayer structure catalyst layer, wherein each catalyst layer has a thickness that is usually 2 to 50  $\mu\text{m}$ . Therefore, the Ueda reference is not required to teach a catalyst that consists essentially of fine particles of platinum. In addition, it is well known in the art that catalysts for solid polymer electrolyte fuel cells consist essentially of fine particles of platinum.

The applicant also argues that Dube et al fail to mention an adhesive layer associated with a fuel cell so therefore the reference is non-analogous art. In response to applicant's argument that Dube et al is nonanalogous art, it has been held that a prior art reference must either be in the field of applicant's endeavor or, if not, then be reasonably pertinent to the particular problem with which the applicant was concerned, in order to be relied upon as a basis for rejection of the claimed invention. See *In re Oetiker*, 977 F.2d 1443, 24 USPQ2d 1443 (Fed. Cir. 1992). In this case, the Dube reference is in the field of applicant's endeavor because the Dube reference discloses that the system may include an integrated fuel cell device. Although the teachings of Dube et al do relate to integrated electrofluidic systems, there is at least a suggestion that the adhesive layer with a specified thickness can be used in a fuel cell system.

***Conclusion***

**THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Tony Chuo whose telephone number is (571)272-0717. The examiner can normally be reached on M-F, 7:00AM to 3:30PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Patrick Ryan can be reached on (571) 272-1292. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only.



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TC

/PATRICK RYAN/  
Supervisory Patent Examiner, Art Unit 1795